

The Times and Register.

VOL. XXIX. No. 17.

PHILADELPHIA, APRIL 27, 1895.

WHOLE No. 868

Original.

SOMATOSE, A TASTELESS, ODORLESS, ALBUMOSES PREPARATION, AND ITS APPLICATION IN MEDICAL PRACTICE.

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Somatose, the albumoses preparation of the Farbenfabriken Vorm., Friedr. Bayer & Co., of Elberfeld, has already become the subject of an extensive literature, so that I believe that the time has arrived to collate the observations thus far published and then add my own, which, in several directions, furnish some new experience in regard to this product.

The question whether the albuminous constituents of the body can be maintained in a state of equilibrium by the peptones as well as by the albumoses could not be decided so long as the investigators employed in their experiments preparations which, although designated as peptones, were not usually pure peptone, but consisted of a mixture of intermediary products between albumen and peptones. After Kuhne had taught us how to separate the different albuminous bodies it was found possible to make metabolic experiments with pure preparations. Politzer and Gerlach arrived at the result that peptone, in the light of Kuhne's teachings, possessed no nutritive value whatever; since its disintegration had so far advanced that it could not make good the demand of the organism for albumen. Voit likewise maintained that peptone is not transferred into albumen and

cannot produce an increase of flesh, that is to say, is not equivalent as a nutriment to albumen. Recently, however, Cahn has again recommended this substance, although, according to Voit, the oxidation power of peptone is inferior to that of albumen. Aside from its uncertain nutritive value, there are other properties which render peptone unsuitable for employment at the sick bed—above all its intensely bitter taste, which increases with the greater purity of the preparation, and which belongs to all peptones, whether prepared by digestion with pepsin or pancreatin, or by heating with water in a pressure apparatus. This disagreeable taste can be covered to some extent by corrigents, and by the aromatic vegetable extracts recommended by English manufacturers as solvents, but in a much better manner by meat extracts, such as is done in the preparation of Koch and Kemmerich. Preparations which are free from extractive matters and only contain peptones, such as Witte's preparation, on account of their bitter taste, can only be administered through a stomach tube. The taste of this preparation is so repugnant that it was vomited even by animals used in experiments. On the other hand, the peptones markedly increase the peristalsis of the intestines and have an irritant effect upon the mucous membrane of the digestive tract. On account of their laxative effect they have been recommended in affections attended with constipation.

The manufacturers have, therefore, aimed in their peptone preparations to reduce the amount of pure peptone as much as possible, and in place of it to add the albumoses which has

been especially successful in Kemmerich's preparation. The albumoses are intermediary stages between albumen and peptones; they are more readily soluble and digestible than albumen and are completely assimilated by the organism, so that they are capable of nourishing the body as well as albumen. According to Politzer and Gerlach, the entire quantity of albumen in the food can be taken up by the body in form of albumoses, and not only maintain it in an equilibrium of nutrition, but also cause a gain in flesh. Zuntz, Munk, Von Noorden, Pfeiffer, Ewald and Hildebrandt have confirmed these results. The albumoses are, therefore, real tissue builders, and in their pure state are characterized by tastelessness and odorlessness. As they are besides free from the disagreeable properties of peptone it has for a long time been the aim of manufacturers to isolate the albumoses from the peptones as much as possible and construct a preparation which consists only of albumoses. The difficulties in the way of preparing such a product have been successfully overcome by the Farbenfabriken Vormals. Friedr. Bayer & Co. in Somatose.

Somatose is a yellowish, finely-granular, perfectly odorless and almost tasteless powder, which is completely soluble in water and watery fluids. The albumens precipitated from this solution by diluted acids are redissolved in excess of acids. On heating, the solution gives no precipitate. Tannic acid, mercuric chloride, ferric chloride, sulphosalicylic, ferro-cyanide of potassium and acetic acid give the well-known reactions. The albumoses can be precipitated by alcohol, during which the Biuret reaction is markedly developed with a bluish coloration. Somatose is prepared from fresh meat, and, therefore, contains all the nutritive salts present in fresh meat. The gelatine peptone which forms readily in peptonizing the collagenous tissues or muscle is eliminated, as well as the nitrogenous bases of meat (creatin, xanthin, etc.), since they pass unchanged through the

body are without nutritive value, and can be regarded only as condiments. Somatose contains no fat and no extractive matters. A 2.15 to 5 per cent. solution of Somatose in water, which corresponds approximately to the proportion of a teaspoon or a dessert spoonful in a cup of milk or tea, is almost entirely tasteless, while gelatine peptone can be detected in every solution, even when present in very small quantities, by its taste. A five per cent. solution of Somatose in water has a yellowish brown color and a feebly alkaline reaction. In the cold or hot solution no formation of flocculi takes place, so that by boiling genuine albumen can be differentiated and separated from the albumoses and peptones. Somatose is a preparation of constant uniformity, which contains only the smallest quantity of peptones. Several analyses of various specimens showed, according to Goldmann (Pharmaceutische Zeitung, 1893, No. 86), only slight deviations in the numbers.

	1.	2.
Water	10.04	9.20
Total Nitrogenous Matter.	12.89	12.84
Albumoses	78.00	77.85
Peptone	3.40	2.20
Ash	6.72	6.78

The difference in the amounts of peptones is explained on the ground that in No. 1 the peptone was determined by direct precipitation with ammonium sulphate, and in No. 2 by the rotary power of the strongly concentrated solution. The not inconsiderable minus to one hundred in both analyses is caused by the organic acids which are contained in the ash in form of carbonates, and hence appear in the estimate. To determine the quantity of water the weighing was done in closed flat glass receptacles, since the powder when freed from water is extremely hygroscopic. To produce a constancy in weight, drying 48 hours in a temperature up to 105 degrees was often necessary. The nitrogen was determined according to the method of Kjeldahl. To determine the peptone 20 grammes Somatose were dissolved in water, precipitated by ammonium sulphate, heated in steam, the residue dissolved in water and treated twice

more as previously. The ash was determined in the following manner: Somatose was carbonized, then lixiviated, and the ash and dried filtrate each burned separately. In the incinerated residue the following were found: Magnesium, potassium, calcium, phosphoric acid, sulphuric acid, carbonic acid, traces of chlorine. The ash, therefore, corresponds in its composition to the salts of meats; especially noteworthy is the amount of the potassium phosphate so important for the formation of muscle and cellular tissue.

The non-occurrence of coagulation on boiling and the complete solubility of Somatose demonstrate the absence of unchanged albumen.

The analyses of Helbing and Passemore ("Somatose, the New Meat Nutrient"), in Helbing's Pharmacological Record, No. 29), showed the composition of Somatose to be as follows:

	Soma- tose. per cent.	Dried Soma- tose. per cent.
Water	8.35	
Solid Matter	91.65	100.0
Mineral Matter	6.64	7.24
Potassium Phosphate ..	0.47	0.51
Organic Matter	85.01	92.76
Total Nitrogen	12.9	14.07
Albumose	78.75	85.92
Peptone	1.9	2.07

According to Goldmann, 14.14 per cent. of nitrogen are contained in the dry substance. If we estimate the amount of albumen from the nitrogen by multiplying with 6.25 we would find in Somatose 88.37 per cent. of albuminous constituents. If, however, we use the multiplier for peptone 6.4, which is more closely related to the albumoses, we will obtain as much even as 90.49 per cent. albumens. The albumoses of Somatose consist only of deuto- and hetero-albumose, and it contains neither protero- nor dys-albumoses. In 100 parts Somatose free from salts, peptone and water, there are 48.2 parts deuto- and 51.6 parts hetero-albumoses, according to the procedure of Kuhne.

Somatose, therefore, has a higher nutritive value than any meat extract or other preparation of meat, and contains four times as much al-

bumen than an equal weight of meat. Inasmuch as all albuminous substances are eliminated with extreme care from Liebig's Beef Extract, all meat extracts as well as all broths and soups prepared from fresh meat have no nutritive value, and hence are completely ineffective in cases where it is necessary to promote the nutrition of the patient. Meat extract has only a stimulating effect, which manifests itself by increased secretion of the digestive juices, and acts also through its contained glycogen, which is regarded as one of the main generators of muscular work in metabolism. It is, therefore, of great interest to compare the meat preparations in the market in respect to their nutritive value with Somatose, and to estimate the relative costs as related to the amount of nourishment furnished. If the quantity of albumoses which alone possess nutritive value are considered in the different meat preparations, it will be found that in spite of its apparently high price, Somatose is cheaper than all other meat preparations such as those of Kemmerich, Kochs, Maggi, Denayer and others. Experiments in nutrition with Somatose have shown that it is capable not only of maintaining the body in an equilibrium of nutrition, but also of producing a gain in flesh. These investigations in metabolism have been made by Hildebrandt, of Elberfeld. Hildebrandt first attempted to answer the question whether Somatose is capable of replacing completely an equivalent quantity of albumen if administered in combination with a small quantity of nitrogenous food, which is below the limit of the albuminous requirements of the organism.

The animal employed for the experiment was a dog weighing 22 kilo. During the first period of four days the food consisted of 200 grammes meat, 200 grammes rice, 55 grammes butter, 10 grammes common salt. During the second period of four days the total amount of meat was replaced by 48.6 grammes albumoses and 6.7 grammes extract of beef. During the third period the first-named diet was resumed.

At the close of the first period of

meat feeding there was a condition of nitrogenous equilibrium, at the commencement of the albumoses period a nitrogenous surplus, on the third day a nitrogenous equilibrium and during the following day decrease of nitrogen. On the average, during the albumoses period, the nitrogenous surplus was less than during the meat period. Toward the end of the second the stools became thinner and contained unchanged albumoses, and large quantities of nitrogenous material, while during the same period the excretion of nitrogen in the urine was on the average less than during the periods of meat diet. Inasmuch as during the albumoses period comparatively less nitrogenous material was retained in the tissues of the body, without any essential change in the bodily weight, it must be assumed that the nitrogen of the albumoses has a higher value than meat nitrogen. Hildebrandt succeeded also in causing the absorption of all the albumoses, by replacing only a portion of the nitrogen of the meat through the nitrogen of the albumoses. By proceeding in this manner the nitrogenous excretion in the feces approximates to the slight excretion during the meat diet. The nitrogenous excretion in the urine is almost the same as that during exclusive albumoses feeding. This, therefore, shows that the nitrogen surplus was more considerable during the period of partial albumoses diet than during that of exclusive feeding with albumoses.

If the pure albumoses were actual substances which might serve as a substitute for the albumen of the body, the next step was to investigate whether the albumoses preparation was suitable for purpose of nutrition when introduced into the tissues by way of the cellular tissue; without having undergone any alteration in the stomach or intestines. For this purpose Hildebrandt first convinced himself of the fact that sterile solutions (in 0.7 per cent. sodium chloride solution) of the strength of 5 to 10 per cent. may be injected subcutaneously without exciting inflammation,

while experiments according to Buchner's method for testing chemotaxis gave negative results.

According to Buchner, solutions of hemi-albumoses, that is, the initial products of digestion of albumens, exert a marked attractive power upon leucocytes, while the end products, the peptones, perhaps in consequence of their poisonous character, have a repellant, paralyzing action upon leucocytes. Solutions of Somatose were subcutaneously injected in animals (the 5 per cent. solution being administered in amounts of 0.5-1 grm. pro kilo. of the animal for several days), were well borne, and unattended with local signs of irritation or disturbances of the general health, because the preparation consists only of deutero and hetero-albumoses of the hemi group as well as of the entire anti groups. The two other constituents of the hemi-albumoses (protero and dys-albumoses), which probably in the above-mentioned investigations of Buchner were the cause of the irritant effects, are absent in the albumoses product of the Farbenfabriken. After injections of 50 c. cm. of albumoses solution (in 0.71 per cent. sodium chloride) in a dog of 10 kilo weight, there was found in the urine neither albumoses peptone, nor albuminates. In cases where the feeding by mouth was prevented it would, therefore, be possible to nourish the patient to some extent by subcutaneous injection of Somatose solution, perhaps with the aid of parenchymatous infusion of salt, which has recently been resorted to in various pathological conditions. In order to elucidate his experiments in metabolism in animals, Hildebrandt (*Zeitschrift für Physiologische Chemie* Band, 18, Heft 2) made an accurate experiment in nutrition on a healthy man aged 28, muscular, without any adipose tissue.

The experiments began with a period of five days' duration, during which the diet consisted of meat, fats and carbo-hydrates; this was followed by a three days' period in which 28.37 per cent. albumen of meat was replaced by an equivalent quantity of albumoses, and a two

days' period in which 63.88 per cent. albumen was thus replaced. During a further fourth period the conditions of the first period of meat diet were restored. The daily quantity of urine decreased during the albumoses period, while its concentration was higher than during the other periods. The nitrogenous excretion in the feces was higher in the second and third periods than in the meat periods. The consistency of the feces was somewhat pasty, not diarrheal.

Hence during the albumoses periods a somewhat smaller nitrogenous surplus occurred than during the periods of meat diet, while the bodily weight increased from 67.25 kilo during the albumoses period to 67.8 and 68 kilo respectively, falling again to 67.7 kilo in the course of the following meat period. It must be assumed, therefore, that the albumoses represent a higher value than the nitrogenous constituents of meat. This assumption is supported by the statement of the person experimented on that he felt stronger and better nourished than during the previous periods, while in the last period of meat diet a feeling of lassitude was experienced.

Recently Adrian reported from Hoppe-Seyler's Laboratory (*Zeitschrift für Physiologische Chemie*, Band, 17, Heft), that the same quantity of nitrogenous food administered in several small portions during the day has a higher nutritive value than the entire food if given at one time, because the albuminous particles dissolved by digestion remain for a shorter time in the intestinal canal until absorption, and are, therefore, not subjective to the further influence of the pancreatic fluid and to decomposition, being absorbed as such (acid albumin, propeptone, peptone). According to Hildebrandt, the increase in weight observed when the bulk of the meat nitrogen was replaced by albumoses is due to the fact that the latter are absorbed essentially in their own form. There is some evidence in favor of the view that an absorption of dissolved albuminous material takes place already in the stomach. Von Mering (*Verhandlungen des XII Congresses für*

Innere Medicin, Wiesbaden, 1893) has shown that solutions of Witte's peptones administered to dogs on whom gastrotomy has been performed were discharged from the pyloric fistula in weaker concentration, so that a portion had, therefore, been absorbed. Hildebrandt found after administration of 6 grammes Somatose in solution by means of a stomach tube to rabbits a small quantity of unchanged albumoses as well as peptones in the urine. After administration of 2 grammes albumoses no traces of these or of peptones could be found, however, in the urine. If the pylorus was ligated there was found after twenty-four hours of 2 grammes only 0.204 grammes albumoses, so that 1.796 must have been absorbed by the stomach. In an experiment on a dog weighing 24 kilo, which received subcutaneously a 5 per cent. sterilized solution, this method of administration was followed by a cessation in the loss of weight previously produced by insufficient feeding, while during internal administration of the albumoses, the decrease in weight was larger. We are, therefore, warranted in assuming the greater nutritive value of the albumoses subcutaneously administered in comparison with the albumoses and meat albumen given internally.

Neumeister asserts that Somatose is excreted unchanged in the urine if injected subcutaneously. He injected 0.1 gm. Somatose into a rabbit and recovered this substance, as he believed, from the urine by precipitation with ammonium sulphate, and no Somatose was present.

Goldmann, therefore, completely confirmed the results of Hildebrandt. He injected into a dog and rabbit subcutaneously 0.5 grammes Somatose dissolved in 10 c. cm. sterilized physiological salt solution, treated the urine with ammonium sulphate, dissolved the residue and precipitated again, until the last precipitate appeared almost colorless. The solution in boiling water, after concentration and cooling, gave with dog's urine neither the sulphosalicylic, nor the biuret reaction; with rabbit's urine, a slight turbidity with

sulpho-salicylic acid but no biuret reaction. An addition of 0.05 grammes Somatose for the urine for purpose of control gave positive reactions. Hildebrandt, therefore, was justified in the opinion that after injection of 0.5 grammes Somatose this substance does not appear either in the urine of dogs or rabbits.

What becomes of the albumoses introduced subcutaneously into the organism? According to A. Schmidt, cytoglobin and preglobulin, the typical components of animal cells, are converted into the blood serum into paraglobulin. Hammersten observed that casein introduced into the blood serum is changed into a body resembling globulin. If albumoses are injected subcutaneously or intravenously in animals, a portion appears in the urine as such, another portion in the form of peptone, although only in slight quantity in comparison to the amount injected, the rest, according to Hildebrandt, being converted into globulin. By direct addition of albumoses solution to fresh blood taken from the vein of a dog, Hildebrandt found a slight retardation of the process of coagulation. The same takes place on addition of deutero-albumose, while hetero-albumose produced a much more marked retardation. Solution of the salts present in this preparation in the corresponding percentage strength also had a marked retarding effect. Injected directly into the vascular system of dogs in the fasting condition neither solutions of albumoses nor of their constituents caused alteration in the coagulability of the blood, in contrast to the behavior of solutions of genuine peptones.

At the sick bed Somatose has proved serviceable both as a dietetic remedy as well as a nutrient in affections of the stomach, especially cancer and phthisis. It is further recommended in all acute diseases, which are attended with fever and debility, in chlorosis and anemia, in rickets; in fact, everywhere where a supply of food rich in albumen and readily digestible is required. One part of Somatose corresponds to about six parts of lean beef in nutritive value, so that single doses vary between

2.5 and 5.0 grammes, while the daily dose may be as high as 40.0 gm. For complete utilization it is better to administer smaller doses, one teaspoonful about three or four times daily. To prepare the solution Goldmann recommends that the powder be stirred into a paste in an equal quantity of water, and then added to the rest of the vehicle, milk, cocoa, coffee, gruels, with or without red wine. Fluids containing tannic acid, such as strong tea and pure red wine, lose somewhat in appearance on addition of Somatose.

To assimilate more closely cow's milk in composition with woman's milk, Dr. Rieth (Berlin Klin. Wochenschr.) advised that the former, after proper dilution, to reduce the quantity of casein, should receive an addition of fat, sugar and albumoses, obtained by heating egg-albumen to 139 degrees. The disadvantage of this albumoses milk consists, however, in that both the evacuations and flatus have an intense odor of sulphureted hydrogen, since the egg-albumen contains sulphur which is retained in the albumoses when prepared according to Rieth's method. Albumoses produced from meat, such as Somatose, contain but slight amounts of sulphur, and hence after administration of milk charged with Somatose the odor of the feces will be much less offensive. According to Goldmann, the addition of Somatose effects a change in the coagulability of cow's milk, which is most advantageous for the digestion of the infant. If to one portion of cow's milk rennet ferment be added and to another rennet and Somatose, the latter will show a coagulum consisting of very soft, almost flocculent casein as in woman's milk, while the milk without addition of Somatose exhibits the well-known thick coagulum. Goldmann recommends as a milk food for infants the following: To one litre of cow's milk add 730 c. cm. water, 10.7 gm. Somatose, 46.0 gm. sugar of milk, and 35.6 gm. fat (that is, 71.0 gm. cream, containing on an average 50 per cent. fat). The entire mixture is then sterilized. This estimate is based on the following figures: Woman's milk contains

—fat, 3.97 per cent.; albumen, 10.78; casein, 1.69; lactose, 5.46. Cow's milk —fat, 3.32 per cent.; albumen, 0.52; casein, 2.91; lactose, 4.84.

This Somatose mother milk is highly recommended by Bosse, who emphasized the advantages of this preparation over all other infant foods in the following manner: "That this product contains no substances heterogeneous in a chemical sense or non-assimilable, and is, therefore, utilized as completely as possible. That it produces a loose, flaky curdling of the casein in the stomach, as in the case of woman's milk, and, therefore, is as digestible as the latter. That it does not transmit substances producing fermentation or disease to the organism, and thus guards the child against digestive troubles and infectious diseases. That it supplies the child with a sufficient quantity of the nutrient salts necessary to the growth of bone and cellular tissue, and thus protects it from rickets and scrofula. And finally, that it does not overtax the digestive organs, but constitutes a readily digestive element for the infantile organism which effects a rapid gain in bodily weight by causing an increase of fat and muscular tissue." "We are therefore completely justified in the statement," says this writer, "that Somatose mother's milk has solved the problem of producing an infant food equivalent to mother's milk in its chemical and physiological constitution, and that feeding with this milk preparation, if conscientiously performed, will give as good results as nutrition from the mother's breast. Moreover, alimentation with Somatose mother's milk is more effective, reliable and attended with less inconvenience, trouble and expense than wet-nursing, and, therefore, decidedly to be preferred to the latter."

Clinical investigations with Somatose have completely confirmed the favorable results derived from physiological experiments. In regard to the clinical employment of the preparation a large number of observations are already at hand, which I will briefly review.

In a case of gastralgia treated by Dr. Scherk, of Hamburg, in which all meat preparations (Liebig and

Kemmerich) previously employed during the attacks had to be discontinued, Somatose was well tolerated, without any inconvenience in comparatively large doses, so that from the use of 400 grammes within four weeks a gain in weight of two pounds was observed. Although this patient was extremely sensitive, she never complained regarding the taste of the remedy.

Dr. Kaatzer, of Bad Rehbürg, employed Somatose with good results in phthisis, giving it in milk, gruels, barley water and potato soup. In a case of pulmonary phthisis with large cavities the condition of nutrition was so favorably influenced that the patient was able to return to his home in Brazil. In a case of pulmonary phthisis attended with intestinal tuberculosis the diarrhoea, which had been present for a number of months, was diminished to two stools daily. Kaatzer especially emphasizes the agreeable manner in which this preparation can be administered in contrast to the unpleasant taste of peptones.

Dr. Scholz, of Bad Cudowa, prefers Somatose to the peptones on account of its freedom from taste and odor, and regards the fact that the preparation has no purgative properties as very advantageous.

Professor Stintzing, of Jena, reports from his clinic that he has found Somatose a very serviceable nutrient, readily taken by patients, and well borne in various diseases attended with severe disturbances of nutrition.

Dr. Fisch, of Barmen, employed Somatose successfully in the following cases: 1. In the case of a very ill-nourished and emaciated patient who had been operated upon for gall stones, a gain in strength and weight occurred after its administration for eight days. 2. In a female suffering from acute anemia due to profuse bleeding, a rapid increase of strength was noted. 3. In an ill-nourished female, an increase of weight of 21.2 pounds was obtained from its use during fourteen days. 4. In an ill-nourished woman who suffered from frequent digestive disturbances and constipation, besides a chronic perimetritis, the digestion was improved

by the administration of Somatose, the stools became regular, and during eight days a gain in weight of two pounds ensued from the use of 100 grammes. 5. In a female who had suffered for a number of years from chlorosis and was very anemic, the strength rapidly increased after the use of Somatose; the lips, which previously had been pale, assumed a red color, the menses became regular. 6. In a female with greatly reduced nutrition, who had been treated for dysmenorrhea, one teaspoonful of Somatose was administered four times daily, and after use of 100 grammes in eight days a gain in weight of one pound was produced. All the experiments serve to prove the fact that Somatose is readily absorbed and rapidly improves the vital powers.

Professor Moeli-Lichtenberg, of Berlin, reports from the Insane Asylum of Herzberge that Somatose was well borne by a patient much reduced in nutrition, and that during the time of its employment an increase of bodily weight occurred.

Dr. Ruhle, of Elberfeld, administered Somatose for a number of weeks in doses of one teaspoonful three times daily in oatmeal gruel, and other soups in a case of puerperal septicemia, and is firmly convinced the patient's recovery is attributable to this food. He observed no unpleasant sequelae, as, for example, with regard to the intestines, and regards Somatose as a valuable addition to the materia medica, preferring it in all cases over other preparations of this kind.

Dr. Loewenstein, of Elberfeld, reports a case of pulmonary phthisis, in which in consequence of the irritating cough the patient had attacks of vomiting five or six times daily, and was unable to retain any food even of fluid character. She now resorted to the use of Somatose for four months, and with so good results that the vomiting ceased entirely.

Inasmuch as Somatose is absorbed with such extreme rapidity, and at once takes part in the nutrition without disturbing the stomach, it is possible by its aid to tide the patient over critical periods, since it can take

the place of ordinary food for a long time.

Dr. Frank Woodbury, "Somatose, a New Nitrogenized Food-Product," in the Medical Bulletin, February, 1894, reports a series of experiments with this substance made by Edwin G. Thompson in the Medico-Chirurgical Hospital in Philadelphia. A sailor was admitted with well-marked symptoms of typhoid fever, with a temperature of 103 degrees. The most prominent symptom in the case was irritability of the stomach; even liquid food, milk and broth and similar preparations were persistently rejected by the patient's stomach, until he was in an exhausted condition. A heaping teaspoonful of Somatose in a cup of hot water seasoned with salt and Cayenne pepper was ordered. This was retained, and was much enjoyed by the patient, so that it was ordered to be given at intervals, but the patient repeatedly asked for it himself, as he preferred it to any other form of nourishment. Under its use the irritability of the mucous membrane passed away. The Somatose was continued throughout the entire course of the disease, which was favorably influenced by it, and the patient made a very good recovery. Thompson obtained the same favorable results in another case of typhoid fever, attended with marked gastric irritability and complete inability to retain any nourishment. Both cases, in the author's opinion, proved conclusively the efficacy of Somatose, both as a sedative to the hyperesthetic gastric mucous membrane, and as an acceptable form of nourishment in cases where other articles of food cannot be retained. Equally good results were obtained in a case of chronic gastric catarrh in which Somatose was administered after lavage of the stomach. Woodbury employed the preparation with success in cases of debility, especially of the acute variety, following influenza or after repeated hemorrhage. In pulmonary affections he found it advantageous to add Somatose to broth, milk, coffee, cocoa and other forms of liquid food. By this means the physical strength of the patient and the return to health after acute illness were decidedly influenced for

the better. Woodbury finally emphasizes the utility of Somatose milk, as compared with albumoses milk, since the latter has the disadvantage that both the evacuations and the flatus have an intensely disagreeable odor, which is almost entirely absent during the use of Somatose.

Bartley (Medical and Surgical Reporter, February 3, 1894) regards Somatose as a preparation of the highest nutritive value. He states that fully digested meat preparations cannot be used long without producing diarrhea and other digestive disturbances. His own experience has shown that after a few days patients develop a disgust for such preparations and decline to take them. The greater the proportion of peptones in these preparations the less desirable clinically they are. For this reason completely peptonized milk has been entirely given up in the feeding of infants, because they will not thrive on it even when they can be induced to take it. Bartley employed Somatose in two cases of carcinoma of the stomach, one of phthisis, one of gastric ulcer with dilatation, two of choleraic diarrhea in infants with marked collapse and one of gastroenteric catarrh (summer diarrhea). In all cases the food was well borne and was retained when all other food was rejected. It was noticeable that in several of the cases, where there was complete anorexia, the appetite returned after from one to three days, and then the patients were able to retain and digest other foods, rendering the further use of Somatose unnecessary. In no case did it produce nausea or diarrhea. The nutritive value of the food could be plainly seen by Bartley in its effect upon the digestion and blood tension. The effect upon the heart seemed to be more permanent than that of a stimulant, and he regarded it as the result of true nutrient action upon the heart muscle, and explained its effect upon the digestive organs in the same way, i. e., by its furnishing nourishment to the mucous membrane of the stomach, as well as to the increased general nutrition. He does not, however, regard Somatose as suitable for long continued use,

but considers it especially useful in an emergency when the digestive organs have failed to appropriate ordinary food. For this purpose it has seemed to him to meet the indications more fully than all other meat preparations on the market. In both of his cases of cholera infantum, a remarkably rapid restoration of the digestive functions occurred after profound disturbances. Bartley concludes that we have in Somatose a valuable nutriment in cases of great exhaustion and in digestive failure.

The most recent publication on Somatose is by Franz Kuhn and Karl Volke from the Medical Clinic of Professor Riegel in Giessen ("Experiments in Nutrition with Somatose, an Albumoses Preparation," Deut. Med. Wochenschrift, 1894, No. 41). These authors believe that the significance of the bodily weight in experiments in metabolism has been too much emphasized in the works of Hildebrandt, and also that the single experimental periods have been too short. They made seven extensive series of experiments with this preparation, varying the methods of the various experiments, which were carried on for twenty days. As regards technique and method of experimentation they fulfilled all the requirements pertaining to the modern study of metabolism. Each substance before injection was analyzed in double samples, the excrements carefully collected and also analyzed. These investigations in nutrition were made both on healthy and diseased persons. In a case of gastric cancer with distinctly palpable tumor and far advanced cachexia no nitrogenous equilibrium occurred during the entire course of twenty days administration of Somatose. On the other hand, as compared with the control period, a diminution in the nitrogenous deficit of 1.0 N. pro die was obtained—a condition of nutrition of not inconsiderable significance in a patient suffering from cancer. After withdrawal of the greater portion of the nitrogenous food administered by mouth, intestinal absorption under administration of Somatose was not much worse than in the control period. A marked im-

provement took place in the condition of the patient during the use of Somatose, notwithstanding the nutritive disturbances. In a case of phthisis with advanced intestinal tuberculosis the general health was much improved by the administration of Somatose. There was a gain in strength and increase of bodily weight and the intense pains in the abdomen were diminished and became more endurable. In the case of gastric cancer the motor functions of the stomach were completely restored, and the paroxysms of vomiting which had previously been present disappeared. In view of the investigations of Cahn (Berlin Klin. Wochenschr.), who states that the peptone preparations hitherto in use have the disagreeable properties of increasing the secretion of hydrochloric acid in the stomach in an excessive degree, Kuhn and Volker made two experiments in regard to this subject. 1. In a case of gastric dilatation due to pyloric disturbances without hypersecretion, Somatose was decidedly inferior to meat or meat powder with regard to the rapidity of its removal from the stomach, but in respect to the secretion the percentage of total acid was less than in the experiments with meat and meat powders. 2. In the second case Somatose was found superior to meat and meat powder in every respect. If the motor activity of the stomach is unimpaired it is more rapidly disposed of, the nitrogenous residue in the stomach at the end of an hour being less than one-fourth of that of the other two preparations. The total acidity and secreted hydrochloric acid amounts to less than during the use of meat, approximating to that during the use of meat powder. Hence the complaints of Cahn against peptones are not applicable to Somatose. Kuhn and Volker as the result of their investigations formulate the following important conclusions:

1. If administered in connection with a diet the nitrogenous constituents of which are inadequate to supply the needs of the organism for proteids, somatose is capable of completely taking the place of the albu-

men in food. Somatose is, therefore, a representative of those preparations which consist exclusively of certain albumoses and is able to maintain the body in a condition of nitrogenous equilibrium.

2. In combination with a diet not deficient in albumin somatose cannot always replace meat, since in the presence of a large quantity of nitrogenous elements in the additional food somatose is of itself insufficiently utilized, and also by producing diarrhea impairs the absorption of other albuminous bodies in the additional food.

3. Inasmuch as the absorption and assimilation of somatose in the intestines is materially influenced by the quality and quantity of the supplementary food, its utilization may be greatly increased by diminution of the nitrogen in the supplementary food by addition of meat to the latter. The same result is brought about by diminishing the quantity of introduced somatose.

4. If attention is paid to this point somatose is well borne by patients without after-effects. Large quantities are laxative and produce some diarrhea. Somatose is well tolerated by phthisical patients with intestinal lesions and profuse diarrhea, and frequently better than meat.

5. In certain forms of gastric trouble somatose is more suitable than other albuminous products, whether because of mechanical reasons or whether in consequence of the secretory condition of the stomach.

6. Somatose cannot be utilized for nutritive enemata.

My own experience with somatose relates to its use in the most diverse affections in which a readily absorbable albuminous food was demanded. I have employed somatose in cases in which the assimilation of food was prevented by disturbance in the alimentary canal or by diseases of other organs. It has proved an excellent nutrient and restorative in exhausting diseases and conditions of prostration due to sudden loss of strength, and in convalescence from fevers and diseases attended with nutritive disturbances. According

to the results obtained by Hildebrandt, a portion of the somatose solution is directly absorbed in the stomach, while the rest of the dissolved albuminous particles remain only for a short time in the intestines before being absorbed, producing no disturbances and furnish no pabulum to the bacteria present in the intestinal canal.

Inasmuch as somatose is capable of taking the place of the greatest portion of the albumens required by the organism, its employment in cholera infantum seemed indicated. I therefore made use of it in 12 cases of cholera infantum in infants from four months to 1 and a half years old. After thorough lavage of the stomach one to two tablespoonfuls of a solution of somatose, one teaspoonful in a cupful of warm water, were administered every hour. In four cases the vomiting ceased as early as the first day. In six cases it ceased completely on the second day, while two children, 4 and 5 months old, died of exhaustion during the first day of treatment. The other 10 patients completely recovered; as early as the second or third day there was an improvement of the general condition, although in all cases marked symptoms of collapse had been present. The stools were favorably influenced by the administration of somatose, becoming less frequent and less fluid. On the fourth or fifth day it was found possible to return to the customary feeding with cow's milk, which now was well tolerated. The most interesting feature of this treatment was the fact that after the administration of somatose solution in eight cases a cessation of the previously rapid loss of weight was observed, and that after resuming the use of cow's milk the children regained their weight in a remarkably rapid manner. In only two cases was there still a slight deficit in weight during the use of somatose, as shown by daily weighing. Inasmuch as the further treatment consisted only in two daily baths in water of 30 degrees of 10 minutes' duration, followed by packing and woolen blankets for half an hour, and as no medical treatment

was resorted to, these favorable results must be ascribed to the somatose which acted here both as a dietetic and stimulating remedy. I employed somatose with the same favorable results in several cases of acute gastric catarrh with vomiting in infants. I further resorted to the use of somatose in several cases of chronic gastric catarrh, and in a case of marked dilatation in consequence of pyloric cancer. The preparation was well tolerated by all patients in contrast to the peptones previously used. In the patients with chronic gastric catarrh somatose effected not only an improvement of the general health and gastric pains, but also removed the existing anorexia, so that a vigorous appetite ensued together with a gain in bodily weight. By the administration of larger doses it was also found possible to remove the obstinate constipation and to completely regulate the bowels. In a case of gastric dilatation due to pyloric stenosis, in which the greater curvature of the stomach reached below the umbilicus, the patient suffered from complete anorexia and muscular insufficiency of the stomach, so that the greater portion of the ingested food was again vomited. After the administration of somatose for several days the vomiting ceased, and the motor functions were restored to such an extent that after about 14 days other fluid food could be ingested without provoking vomiting. The pains were also alleviated, and the general condition improved in a very favorable manner.

In the case of a very nervous woman suffering from gastralgia of hysterical origin, together with anorexia, who manifested a repugnance towards all meat and peptone preparations which she had taken during her previous attacks, somatose was administered without her knowledge in milk, and not only diminished the irritability of the gastric mucous membrane, but also produced a vigorous appetite and shortened the period of convalescence which under other circumstances would have lasted some time.

In two children suffering from typhoid fever, who vomited all fluid

food, milk, meat, broths, etc., and in consequence had rapidly emaciated, somatose was administered, dissolved in hot water, and was well relished. The irritability of the gastric mucous membrane disappeared in the course of five or six days, so that other kinds of fluid food were tolerated. In conjunction with this there was a distinct improvement of the general health, and the abdominal pains, which in one case were severe, were ameliorated, while the stools became less frequent. Convalescence in both children was remarkably rapid.

I also used somatose in cases of children who were unable to retain any food on account of persistent coughing. Among them were a number of children suffering from severe attacks of whooping cough and marked vomiting, attended with great exhaustion, in consequence of the inability to take sufficient food. Somatose, unlike other fluids, was not vomited, and by its aid it was found possible not only to prevent any further loss of weight, but also to bring about a favorable state of nutrition. Two children, 4 and 6 years of age, whom I weighed daily, gained in weight one and one and a half pounds respectively in the course of 14 days. Somatose acted in the same favorable manner in two cases of advanced pulmonary and intestinal tuberculosis, in which, besides the frequent diarrheal attacks, there was an irritating cough which frequently caused vomiting of food. Somatose dissolved in milk was never vomited, and during its administration there was an increase in nutrition of the greatly exhausted patient. The violent abdominal pains became more endurable and the diarrhea was relieved.

As a restorative, somatose proved very serviceable in convalescence from febrile and exhausting diseases, such as typhoid fever, pneumonia, the puerperal state in several cases of hemorrhages, and in one case of ulcer of the stomach, after a loss of blood of 1 1-2 litres. In all cases somatose was well borne, being administered in the most varied solvents, such as milk, meat broths,

milk soups, gruels, cocoa, etc., and in every case it exhibited a remarkably favorable influence upon the general health, producing a gain in strength and weight.

Especially noteworthy was the remarkably favorable influence of somatose in cases of heart disease, and upon the secretion of the mammary gland in nursing woman. Whether this was attributable to a direct nutrition of the heart or a direct action upon the mammary gland, or whether these beneficial effects upon both organs were due indirectly to an improvement of the general state of nutrition, I am unable to decide. In several cases of weakness of the heart I was able to observe after administration of somatose a distinct increase of the pulse tension, and in two patients suffering from swelling of the extremities, in consequence of compensatory disturbance of the heart, a considerable diminution of the edema occurred, which could only have been effected through an increase of the power of the heart.

In cases of nursing women with decreased secretion of milk, who suffered from pains in the back and tension of the breasts—signs of drying up of the secretion—I was able by administration of somatose, one teaspoonful three or four times daily, to cause disappearance of the pains and increase of the secretion, which again became diminished after discontinuing the preparation. In this way I succeeded in several instances in prolonging the period of wet-nursing.

As regards the subcutaneous employment of somatose and nutrition with somatose mother's milk, I have had no personal experience.

On the ground of my observations I would offer the following conclusions: 1. Somatose is an odorless and almost completely tasteless albumoses preparation, which is well relished by children and adults, and can be administered in the most diverse solvents, even without knowledge of the patient. 2. Somatose is well tolerated by the diseased alimentary canal. 3. When administered in frequent small doses during the day somatose is completely utilized,

producing a gain in strength and weight, and improvement in the general health. 4. Somatose does not give rise to nausea or diarrhea, although single large doses act slightly laxative. 5. In view of its nutritive value somatose is the cheapest meat preparation. 6. With the aid of somatose it is possible to tide the patients over certain critical periods since it is capable of acting for long periods as a complete substitute for nitrogenous food. It may, therefore, be employed with good results in all diseases attended with fever and marked emaciation, and in acute conditions of exhaustion due to loss of blood, as well as in diseases of the digestive tract where we desire to avoid the risk of taxing the stomach and intestines with other foods, and of producing gastric irritation. 7. Somatose acts very favorably upon the heart and circulation. 8. Somatose produces an increase of secretion of milk in nursing women.

APPENDIX.

Since writing this article two papers have appeared which confirm the favorable results of other observers.

Dr. P. J. Eichhoff (Berlin Klin. Wochenschr., No. 46, 1894) employed somatose as a nutrient, in addition to the ordinary diet in that form of cachexia which not infrequently attends cases of severe syphilis. He administered it in the following manner: One teaspoonful of somatose was dissolved in warm water, then added to one-third litre of milk, and this quantity was given morning, noon and evening, in addition to the ordinary diet. A case is cited by Eichhoff to illustrate the effects of somatose in syphilitic cachexia. The patient had been under treatment for 10 years for severe tertiary cutaneous syphilis, and complained of severe pains and sleeplessness. During an inunction cure he developed mercurial stomatitis which greatly reduced his health and necessitated discontinuance of the treatment. Somatose was given in the above described manner and the treatment with mercurials resumed, which was now well tolerated. Remarkable improvement was soon manifested.

The patient felt much stronger and his former wretched condition soon gave place to a healthy appearance. During the four weeks that somatose was given a gain of about 10 pounds in weight was noted, an increase of three pounds taking place during the last eight days.

Reichmann, of Elberfeld, reports his results with somatose in phthisis, pleuritis with marked loss of strength, chlorosis, anti-dyspeptic disturbances of various kinds with marked vomiting. Somatose was always well borne and no gastric or intestinal disturbances or nausea were observed. In some cases a remarkable increase in weight was noted within a short time, one patient with incipient phthisis gaining 4 1-2 kilo within three weeks. Somatose milk was also administered to a child 8 weeks old suffering from vomiting and diarrhea. The stools became normal and the vomiting diminished. During administration of somatose milk for 10 weeks the child gained 300 grammes in weight. Reichmann also recommends the use of somatose chocolate and biscuit. ("Practical Notes on the Use of Somatose," Deutsch. Med. Wochenschrift, No. 47.)

TWO CASES OF LA GRIPPE OF PSEUDO-PHTHISICAL FORM.

(Chatin and Collet in Lyon Med., 1894, No. 41.) These writers observed two cases of influenza with pulmonary complications which they were forced to regard as phthisis from the physical examination. There existed dullness on percussion over the apices, sonorous rales, cavernous respiratory murmur, copious, purulent, nummular sputa. In one case the diagnosis of phthisis was given up, because there was no fever and no loss of weight, and especially because no tubercle bacilli were found in the sputum. The other case proved fatal, and the autopsy showed edema of the lungs, splenization at the apices, no sign of tuberculosis, no bronchopneumonia, no caseous foci. Similar observations have been made previously.—Centralblatt für innere Medicin.

The Times and Register.

A Weekly Journal of Medicine and Surgery.

FRANK S. PARSONS, M. D.,

EDITOR AND MANAGER.

Subscription Price, - - - \$1.00 Per Year.

Send money by bank check, postal, money or express order, payable to The Medical Publishing Co.

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PUBLISHED BY

THE MEDICAL PUBLISHING CO.

Communications are invited from all parts of the world. Original articles are only accepted when sent solely to this Journal. Abstracts, clinical lectures, or memoranda, prescriptions, news and items of interest to the medical profession are earnestly solicited.

Address all communications to

Room 718, Betz Building.

Entered at the Philadelphia Post Office as second-class mail matter.

PHILADELPHIA, APRIL 27, 1895.

THE RETAIL MILK TRADE.

As the summer months approach the question of milk in infant feeding becomes rife. In most of our large cities there are dealers who take every precaution in the supply of milk served their customers, but the ordinary milkman takes no precautions whatever. A few send a special can to each family. Those, however, who are curious in such matters may see that the little cans are sometimes filled round the corner from the main churn which ornaments the centre of the milk cart. As regards the great mass of the milk supply, however, there is not even a pretense of doing anything but ladling it out from an open can in the public street. Although they may be washed and steamed, the cans themselves are far from tempting; the men who distribute the milk may have to push their arms down into the big cans to get the milk to fill the little ones, and they have to pour the milk from can to can, manipulating it so as to minimize, as far

as may be, the unfair amount of mud which the last customer would otherwise receive. These processes are carried on in the open street. Everyone knows the cloud of dried manure which in a city wind constitutes dust, and in the midst of which the open-can milk trade is carried on. Added to all this we have the danger of the milkman being a carrier of infection. It seems that the only way out of the dangers of the retail milk trade at present practicable lies in the distribution of milk in sealed bottles. It would carry far better, for in a full bottle it would not get appreciably churned; it would keep better, for the bottle being washed and boiled by aid of proper appliances would be far cleaner in a biological sense than the average milk bowl becomes when washed by the average cook; and the milk would not only be protected from adulteration and infection by the milkman, but it would be far less exposed to evil influences and bad odors in the kitchen and the larder. Moreover, it is no new thing.

THE BOILING POINT OF MILK.

Dr. Edmunds, writing in the British Medical Journal, makes the following observations on this subject: Referring to the temperature at which typhoid bacilli are killed, a correspondent assumes that milk boils at 180 to 190 degrees F. This is a mistake which needs correction. Milk boils at a temperature higher than that of water, and it is well known that boiling milk inflicts a much more serious scald than boiling water. The point at which milk boils will vary half a degree or more, according to the amount of its saline and other non-aqueous constituents, but I find that a fair sample of milk, taken from my own kitchen, boils at 213.5 degrees F. when tested with a standard chemical thermometer. I have always advised that milk boiled for one minute is made safe by the killing of any infective germs which it might have contained. The butter contained in the milk does not seem to raise its boiling point, but it is well known

that butter and other fats and fixed oils boil at a very much higher temperature, and that boiling fixed oils destroy the skin as effectually as melted lead. In the manufacture of tin plate—that is, sheet iron plated with tin—the tin is kept melted under melted tallow, and the clean sheet iron is tinned by being passed through this bath in molten tin. Fixed oils may be heated to about 500 degrees F. without undergoing material change, but at about 600 degrees F. they begin to boil, owing to the evolution of gases, which are set free as a process of destructive distillation. It is generally held that the typhoid infection of milk is due to contaminated water used for washing the milk vessels or for augmenting the bulk of the milk by fraudulent additions. My own opinion is that an escape of fecal matter from the cow while being milked often falls into the milk-pail, and that this is generally the real cause of typhoid infection in milk. I have actually seen this to occur when inspecting dairies and examining suspected cows, and I am perfectly sure that it often takes place. The polluted water theory seems to me to be far-fetched and inadequate.

CONSUMPTION AND MARRIAGE.

The Medical Press of April 10, 1895, gives an interesting editorial concerning this important subject bearing on the advisability of intermarriage of consumptives:

The question as to the responsibilities incurred by the marriage of persons having a history of hereditary phthisis has lately been forced upon the attention of the public by a breach of promise action in the law courts. Into the merits of that particular case we do not propose to enter, but at the same time a brief review of some of the broader aspects of the situation can hardly fail to be of interest to medical readers. One of the points advanced in the recent trial was the distinction between acquired and inherited phthisis. No doubt there is a considerable difference betwixt the two con-

ditions. In the one case the phthisis supervenes on chronic bronchitis, emphysema, or other long-continued inflammatory lung trouble, and may be spoken of as "accidental." Still, the fact of the occurrence of such a complication is in itself strongly suggestive of predisposition, which might be revealed by a careful study of ancestral and collateral family history. In the second case, that of inherited phthisis, we have to deal with a disease in which heredity is a strongly marked and essential feature. Dr. Thompson found that out of 3000 consecutive cases among males, taken from the Brompton Hospital Records, 36 per cent. had a family history of phthisis, while out of a similar number of female cases 58 per cent. had such a history. Whatever the scientific explanation of the fact may be, there can be no doubt whatever as to the importance of hereditary predisposition in the determination of tubercular disease. In any scheme for the stamping out of phthisis the question of the marriage of individuals springing from infected stock must occupy a prominent position. It is a mere commonplace of every-day conversation to say that people who suffer from syphilis, consumption, insanity or other inherited disease have no business to marry. Nay, many philosophers go much further than that, and hold that the State should step in and forbid such marriages altogether. Without indorsing so extreme a view it may be remarked that the State is so far directly concerned that it has to provide for the degenerate offspring of such marriages. The modern view of tubercular disease, the curse of northern climates, is that it is a preventable condition. Having arrived at that conclusion, the next nut for the sanitarian to crack is presented in the pregnant query, "If preventable, why not prevent?" Certainly the proposition that marriages between persons of phthisical history should be prevented by law has never yet entered into the sphere of practical politics. It is quite possible that with more extended views as to the responsibility of the individual to society he

may one day be forbidden to bring diseased offspring into the community. In the case lately brought before the law Courts it is somewhat unfortunate that the issues were obscured by personal matters, so that no satisfactory legal opinion could be gained as to how far the concealment or misrepresentation of family history as regards consumption might be held to warrant a breach of contract to marry. In commenting upon the case some of the newspapers have said that the defendant, to have been within the law, should have made his promise of marriage conditional upon the absence of phthisis in the lady's family. We doubt if such a course would be found possible even to the most case-hardened and unemotional lawyer. One thing is certain, namely, that the future preventive treatment of phthisis, no less than of insanity, must to a great extent depend upon the restriction of the marriage of persons predisposed to those conditions. Before any practical step can be taken in such a direction, however, the principle will have to be accepted and indorsed by the administration of our law. It is probable that a few generations hence our social philosophy will have so far advanced as to make the existence of any serious hereditary taint perfectly good ground for breaking off a contract to marry, but as things go, it is not impossible that before that time both phthisis and actions for breach of promise of marriage will have vanished off the face of the earth.

TANNIN IN PHTHISIS.

The Medical Times and Hospital Gazette speaks thus favorably of tannin in consumption: "French physicians have for some years used tannin, with or without sulphate of quinine, in the treatment of acute phthisis, and they claim for it, apparently with justice, very remarkable results in the diminution of fever and the removal of symptoms. It is a physiological fact, to which attention has not been sufficiently drawn, that rabbits into which tannin has been injected are much more

refractory to injections of tuberculin than animals in which such injections have not been made. The treatment at present may be termed empirical, but it is worthy of note that such shrewd observers as our French brethren are appear to consider that the treatment is most efficacious. They recommend that tannin should be given to the extent of two or three grammes a day in divided doses, and Professor Potain, who has used more than twice this dose for certain patients at the Charite Hospital, considers that such a dose is in most instances too large, as it tends to depress the strength of the patient. The remedy is comparatively little used in this country in these cases, and it certainly merits a fair trial. By a similarity of argument, it should also be beneficial in attacks of acute congestion affecting other organs of the body."

MEDICAL MEN AND TEMPERANCE.

There is in all probability no class of men who are thrown into closer everyday contact with the evils of intemperance than members of the medical profession. In the course of hospital and private practice they have before them constant object lessons of the havoc played in all ranks of society by the demon drink. It is not a little curious, in view of these facts, that their education as to the effects of alcohol upon the human system is not aided by specialized study in their student days. A dozen lectures on the subject in the course of each session would suffice to cover most of the ground, and the medical practitioner would then go out into the world with his eyes open to some of the conditions which he will have to encounter in actual practice. Speaking broadly, most medical men advocate temperance, but only comparatively few are strenuous supporters of total abstinence. There can be no doubt that a great responsibility rests with the profession in the matter of alcohol. Wine or spirit forms a pleasant and convenient stimulant in many mor-

bid states, but a patient is apt to continue their use long after the occasion has passed away. Then, again, much alcohol is administered in the medicine itself. Supposing a mixture to contain two or three drachms of various tinctures, then the doctor is actually dosing his patient with spirits and water, of a strength almost equal to that of ordinary grog. Without advocating extreme views, we venture to assert that the profession generally is not sufficiently alive to its grave responsibilities in the direct or indirect prescribing of alcohol.

DR. REEVES VINDICATED.

Dr. James E. Reeves, of Chattanooga, Tenn., is to be congratulated upon the successful issue of his fight against the nostrum termed "the Amick cure for consumption."

Correspondence.

PERITONITIS.

Editor of "Times and Register."—Physicians in Seattle as elsewhere in this country are still treating abdominal inflammation by full doses of opium and morphine, notwithstanding the now well-established fact that this drug promotes septicemia. It seems very strange that this old practice is so preserved and fostered in this antiseptic age. The practice must be of comparatively modern origin, too, for Cullen in his *Materia Medica*, published in 1789, in Edinburgh, distinctly advises against the employment of opium in the treatment of inflammation, "except in the suppurating state of inflammation, and as soon as a determination to this has taken place we suppose the phlogistic action of the system to be very much taken off, and, therefore, that the pain of suppuration may be safely relieved by opium, as we are at the same time persuaded that opium promotes the process of suppuration." And careful modern observers know that Cullen was right. Yours truly,

A. DE VOE.

Electro-Therapeutics.

IN CHARGE OF
DR. S. H. MONELL, New York.

DERMATO-NEUROSES AND THEIR TREATMENT.

Continuous and interrupted electrical currents have been recommended in the treatment of trophic ulcers by many authors. Others have employed the continuous current in the treatment of morphea and vitiligo with some success. Beard and others have recommended the continuous current in the treatment of a large number of cutaneous affections, particularly in the treatment of eczemas. Like these authors, I have obtained variable results in the treatment by the continuous current of the dermatoneuroses, of which I have spoken above. We must here recall particularly that Silva Arango, of Rio Janeiro, has obtained very remarkable and very encouraging results in the treatment of elephantiasis by the continuous current.

By electrolysis I have cured many cases of cutaneous pruritus, of vulvar and of anal pruritus, which had been absolutely rebellious to all previous treatment. This method, however, is very painful and is applicable only to very localized pruritus. I have been obliged to abandon the use of the Faradic brush, which had only given me very irregular results. During the last two years I have employed the induced current with the most unexpected results, in about 25 cases of localized or general pruritus, the more tenacious of which had resisted all treatment. A good number of cases of the extremities vulva and anus were cured after a variable number of applications. The eczematous or lichenoid condition secondary to the pruritus disappeared. In a certain number of cases the pruritus was relieved considerably, but did not entirely disappear. In some cases the pruritus resisted all treatment.

I have obtained analogous effects in the treatment of generalized pruritus, but the results have not been so good as in localized cases.

The following is the method of em-

playing the induced current: The patient is connected with one pole of a powerful static machine and insulated. A metallic point connected with the other pole is then held at about 0.10 to 0.15 cent. from the affected area. The patient experiences a soft blowing sensation, accompanied sometimes by slight pricking feeling. The point ought to be passed slowly over the whole of the affected area. The total duration of seance should be about 12 to 15 minutes. This method is of great service in rebellious cases of cutaneous pruritus. I have also treated a large number of dermatoses by means of the induced electrical current. These include eczema, lichen, urticaria, morphea, vitiligo, local asphyx of the extremities, trophic ulcers, tropo-neurotic paladoides, etc. The results have been very inconstant, and vary from cure or relief to aggravation.—H. Leloir.

THE CURE OF STRABISMUS BY ELECTRICITY.

Dr. W. L. Capell, of Omaha, recently reports the correction of strabismus by a simple and painless method. "It consists in the application of the negative pole of a galvanic battery with an E. M. F. of from three to six cells to the short rectus muscle and the positive pole to the long rectus muscle, causing the strengthening of the weak muscle and correcting the deformity. The doctor cites two cases, one of which he reports cured after six months' treatment and the other improving one-half in less than 30 days.

ELECTRIC SAFE PROTECTION.

In the Electrical Review for March 20, Dr. G. P. Hachenberg writes at length of a plan to make safes burglar-proof by electric alarm wires running to a watchman's bell. The author appears to consider this a new suggestion and he illustrates the idea with a cut. A wooden box can be made burglar-proof, he

thinks. For the benefit of any readers who may be interested in this "new" device to defeat the burglariously-inclined I would say that in the jewelry centres of our large cities the idea is systematically developed on a very extensive scale. For at least 20 years Maiden Lane, New York, has been protected in this way. After the safe is locked a casing of light wood and paste-board is placed around it. The panels of the case are wired, signals are arranged and a central office watchman's service is organized to protect every subscriber.

TESLA AND HIS WORK.

Probably most physicians who employ electricity in medical practice have heard of Nichola Tesla, whose laboratory and apparatus were destroyed by fire on March 13. Although a young man he has excited great interest throughout the world both in his work and in himself. As many who have read of his loss would like to know how he himself regards it, the following portion of a recent interview is repeated here:

"I was engaged on four main lines of work and investigation. One of these was the oscillator that combines the steam engine and dynamo. This I regard as a practically perfected machine. Another was improved methods of electric lighting. Another was the transmission of intelligence any distance without wires. A fourth, which is an ever-present problem with every thinking electrician, touches the nature of electricity. Each of these questions and many others I shall follow up."

If Mr. Tesla is not more of a visionary dreamer than a practical electrician, he bids fair to make the most sensational reputation yet made by any inventor with the possible exception of Edison. The poetic temperament is strongly marked in Tesla, and he may not succeed in materializing all his fancies. If he fails to produce artificial sunlight and to telegraph without wires we would be pleased to have him devote some of his undoubted genius to the improvement of electro-medical apparatus.

Medicine.

IN CHARGE OF
DR. E. W. BING, Chester, Pa.

ANOTHER CONSUMPTION "CURE."

The United States Consul at Berlin has sent home to Washington an account of an alleged cure for consumption, discovered by Dr. Louis Waldstein, of this city. The text of the Consul's letter is printed elsewhere. This text shows that the ingenious inventor has not yet discovered a cure, but only a theory of a cure. The theory is this:

"By successive injections of minute doses of pilocarpine in the veins he arrives at a gradual stimulation of the lymphatic system. That system increases the white corpuscles in the blood, which corpuscles, as is well established through Metchnikoff, of the Pasteur Institute, of Paris; Hankin, of Cambridge, and Buchner, of Munich, in some way not generally agreed upon, do certainly overcome and cause to be harmless those poisonous particles in the blood which produce disease. Metchnikoff thinks that the microbes which destroy the red corpuscles of the blood are swallowed and englobed alive by the white corpuscles. Hankin and Buchner think that the white corpuscles merely absorb the dead microbes, and, therefore, calls the white corpuscles 'alexine,' or protective particles. Dr. Waldstein goes to the fountain whence these white corpuscles spring, and tries to enliven its action and productiveness when, through disease, these health-giving particles have become too few to keep the blood in proper order."

Dr. Waldstein has not yet tried this theory in pulmonary tuberculosis, but in one case of lupus of the hand the results are spoken of as extraordinary.

We cannot but feel the strongest skepticism of the alleged discovery, and it is unfortunate that, if there is merit in it, the matter should be made a subject of governmental correspondence and newspaper adver-

tisement on the strength of, as it appears, a single case.

Lupus runs a very curious course, and we all recall the occasional subsidence of the disease under injections of tuberculin and cantharidin, as well as in thyroid feeding.

The basis of the theory itself is weak, for we know that in those conditions in which the white blood-cells are excessively numerous, such as leukemia, the patients are ill and show no increase in vital resistance.

Our consuls should find better employment than in advertising new remedies and in indorsing sensational therapeutic theories.—New York Medical Journal.

DISINFECTION OF BUTCHERS' SHOPS.

M. Miquel and M. Crinon, after a series of experiments, have ascertained that an aqueous solution of zinc chloride of 3.5 per cent. prevents the putrid fermentation of bones and debris in butchers' shops and slaughter-houses. It also prevents the transmission of septic bacteria existing in the meat to another organism than flies. This solution removes all smell and allows the material to be used for industrial purposes. M. Nocard considers a two per cent. solution efficacious.—New York Medical Record.

SYPHILIS IN JAPAN.

According to the recent report of the Japanese Sanitary Bureau, Japan has 1,401,226 prostitutes, of whom but 44,700 are syphilitic. The prostitute is subject to inspection and license in the Island Empire. The proportion of prostitutes to the population is nearly that of London, according to the figures of Jeannel, which are approximative and rather under than over the mark. The syphilis rate is less than one-tenth as great in Japan, where is must be remembered official medicine is on a level with that of Europe, and official inspection is not fettered by personal liberty claims. As prostitution in Japan does not debar from marriage, since citizens even of the middle class take their wives from the tea-houses, there is possibly wide-

spread syphilization which would increase immunity to the disease.—New York Medical Record.

THE OUTLOOK FOR CHOLERA IN EUROPE.

The official reports indicate that cholera will prevail in Europe during the coming warm season as it did last year. The threatening sources of infection are Russia, Galicia and Turkey, where the disease has been present throughout the winter. There has been no cholera in Belgium since the last week of November; three cases were reported in Germany in the last three weeks of December, and seven in Holland on December 8. The disease appears to have been suppressed during the cold weather in all parts of Western Europe which were infected last summer and fall, Galicia excepted. In this province of Austria-Hungary, to which cholera was brought from the adjoining parts of Russia, and where the number of deaths last year was very large, the disease has prevailed throughout the cold season, the official reports showing 877 cases and 450 deaths in the period between December 3 and February 17. At last accounts there was cholera in 31 governments or provinces of Russia.—New York Medical Record.

THE TREATMENT OF OBESITY.

Extensive trials have been made in France with thyroid extract in the treatment of obesity, and cases are recorded in which it would seem that very marked results followed the employment of this remedy, either by subcutaneous injection or by the mouth. The dose usually given amounted to about 15-2 minims of the thyroid juice daily, and in three months, in one instance, the patient's weight fell nearly 40 pounds. As soon as the treatment was discontinued the loss of flesh also ceased, and when the thyroid extract was resumed a daily loss of flesh also ceased, and when the thyroid extract was resumed a daily loss of between three and four ounces again occurred. In other cases, however,

the treatment was followed by no marked results, and the conclusion therefore, is obvious—either that the cause of the obesity must have been different, or that the thyroid extract may have been impure. On the other hand, it has been conclusively proved, in this country, that the use of the remedy may be followed by somewhat dangerous nerve symptoms, and that, in fact, the thyroid extract, powerful as it has proved to be in the treatment of various diseases hitherto considered to be difficult of cure, may be attended by results of an alarming character; and there is, therefore, reason to feel that firms which prepare this remedy would be well advised to dispense it only under medical direction.—Medical T. and H. G.

DIETETIC TREATMENT OF PHTHISIS.

Never take cold mixtures if they can possibly be avoided.

Food should be taken at least six times in the twenty-four hours; light repasts between the meals and on retiring.

Do not eat when suffering from bodily or mental fatigue or nervous excitement.

Take a nap, or at least lie down for twenty minutes, before the mid-day and evening meals.

Starches and sugars should be avoided, as well as all indigestible articles of diet.

So far as possible each meal should consist of articles requiring about the same time to digest.

Only eat as much as can be easily and fully digested in the time allowed.

As long as possible, systematic exercise should be taken to favor assimilation and excretion; when this is impossible, massage or passive exercise should be undergone.

The food should always be nicely prepared and daintily served—made inviting in every way.

The following diet sheet is suggested for the early stage: On awakening—Eight ounces of equal parts of milk and seltzer, taken slowly through half an hour. Breakfast—

Oatmeal and cracked wheat with a little sugar and abundance of cream; rare steak or loin chop with fat; soft boiled or poached egg; cream toast; half pint of milk and a small cup of coffee. Early lunch—Half pint of milk or small teacup of squeezed beef juice with stale bread. Mid-day meal—Fish; broiled or stewed chicken; scraped meat ball; stale bread and plenty of butter; baked apples and cream, and two glasses of milk. Afternoon lunch—Bottle of Koumyss; raw scraped-beef sandwich, or goblet of milk. Dinner—Substantial meat or fish soup; rare roast beef or mutton; game; slice of stale bread; spinach; cauliflower; fresh vegetables in season (sparingly).—Practitioner.

AN INNOXIOUS MICROBE.

M. Charrin has ascertained the curious fact that the milk of wet nurses, who themselves are in the enjoyment of the rudest health, and whose charges do not cease to thrive and put on weight, may contain in considerable numbers the terrible white staphylococcus which some authorities would have us believe is so deadly. This discovery, which was proclaimed at a meeting of the Societe de Biologie in Paris, would seem to strike a severe blow against the modern germ theory of disease. In this connection, a writer in *L'Union Medicale* makes the following suggestive observation: "In reality, as regards the breast as well as the bronchi, the intestines, etc., if frequently the pathogenic agent makes its entry from without, at times it pre-exists within the system, awaiting some occasional cause, such as traumatism, a febrile affection, or other, in order to make its presence manifest by swarming. What is the nature of this occasional cause? Calling it traumatism, etc., does not help towards the elucidation of the knotty point. The staphylococci at one moment are beneficial and wholesome towards their human host, at another they become virulently noxious. What is the real cause of this change of front? It is not too much to say that we know nothing whatever about it.—*Provincial Medical Journal*.

Therapeutics.

IN CHARGE OF
DR. LOUIS LEWIS, Philadelphia.

THE THERAPEUTIC EFFECTS OF BETA-NAPHTHOL BIS- MUTH.

Dr. Hugo Engel, in the *New York Medical Journal*, of March 30, gives an exhaustive account of his experience with this drug, with the citation of several cases. His conclusions are that beta-naphthol bismuth is a very efficient drug in those conditions where fomentation is going on in the stomach and intestines with dangers of auto-infection. He considers it especially valuable in diseases due to the presence of infectious material in the alimentary canal both in infants and adults.

ANTITOXINE IN DIPHTHERIA.

Drs. White and Fischer, in the *New York Medical Journal*, March 30, refer to the admirable results they have obtained in the use of Aronson's heilserum in diphtheria. Children receiving injections in the evening would be surprisingly well the next morning.

THE ANTITOXIN TREATMENT ABROAD.

The German Government has issued an order that before antitoxin can be offered for sale in the German Empire it must be submitted to the Institute of Infectious Diseases at Berlin. After examination the Institute will mark with a special stamp the date and number of the sample on the bottle. This regulation came into force on April 1. A measure similar to that passed by the German Government is now before the French Legislature. The French Minister of War has decided that a supply of antitoxin for use in military hospitals shall be kept ready at the headquarters of the medical staff of each army corps. Reports of all cases in which the serum is used must be sent in to the proper authorities within 15 days.

THE INFLUENCE OF ERYSIPELAS ON THE COURSE AND TERMINATION OF ASIATIC CHOLERA.

N. Blagowjeschtschenski (Medicinskoje Obosrenje, 1854, No. 15), during the cholera epidemic superintended the bacteriologico-clinical station opened in Merv (in the trans-Caspian province), and observed here, among 300 cases of cholera in hospital, with a mortality of 52 per cent., the coincidence of this disease with erysipelas four times. In these cases, in all of which the diagnosis was confirmed bacteriologically, the erysipelas was first manifested during the algid stage on the third or fourth day of the disease. In every case the appearance of the eruption influenced favorably the course of the cholera. The low temperature yielded at once to the high temperature curve of erysipelas. Diarrhea and cramps ceased immediately and the general condition of the patient became markedly improved within twenty-four hours. The languor disappeared, urine was excreted, appetite and sleep returned. The course of the erysipelas was also relatively light and the eruption not extensive. In conclusion, he writes: "If one can assume that, under the influence of the toxin producing cholera, the heat centre in the organism is paralyzed, in the same way it can be accepted that this centre under the influence of the erysipelas toxin regains its irritability.—Centralblatt für innere Medizin.

DIET IN ULCER OF THE STOMACH.

Food should be chosen that is digested in the intestines, such as milk, eggs, starches, fruits and green vegetables; farinaceous substances and eggs should constitute the chief diet. Lentils are preferable to potatoes and beans; among green vegetables, salads are excellent; green peas, turnips and carrots should be mashed before eating. Light puddings are easily digested, especially if they contain eggs.—Dr. Roux, Journal d'Hygiene.

Miscellany.

EXPULSED FOR ADVERTISING.

A sensation was caused in medical circles in Georgia by the expulsion from the Georgia Medical Association of Dr. W. L. Bullard, of Columbus, one of the leading eye and throat specialists of this section, on the ground that he had lost standing in his profession by advertising in a newspaper. The Association is in convention here and expelled him without a dissenting vote.

The Buffalo Medical and Surgical Journal celebrates its fiftieth anniversary by increasing its number of pages from 64 to 80 of reading matter.

PHENOMENAL PREMATURE MENSTRUATION.

BY D. L. PEEPLES, M. D.
(Navasota, Tex.)

Mrs. W. B., a primipara, was delivered with the forceps of a girl on January 25, 1895, at noon. Five days later, or at the age of five days, January 30, 1895, at 2 P. M., the child began to menstruate, which caused much parental alarm, resulting in a second summons for me. Being absent I failed to arrive until 6 P. M. On my arrival the nurse informed me that she had cleansed and powdered the parts well an hour previously. On examination I discovered the vaginal canal fairly well filled (in my mind) with undoubted menstrual blood, as it was traceable just as high up as I possibly could determine, without a particle of abrasion, irritation, injury or inflammation along the vaginal canal whatever. Cessation of menstruation occurred some time during the following night. The breast and genital organs were remarkably well developed at birth, and created some comment among those present, also vivid impressions upon my own mind. Should this little phenomenon continue to have periodical catamenia I will report the same.—N. Y. Medical Journal.

AN ELECTROSTATIC PAIR.

(From Hardware.)

He was the gallant engineer
Of a giant dynamo;
She sang to the wires the whole day long
With a chorus of "Hello!"

He loved this telephonic maid,
Till his heart's vibrating plate
Was magnetized and polarized
At a milliamperic rate.

His love he well expressed in ohms,
And amperes, or even in volts;
In voltaic phrases and dynamo figures,
Or currents, arc lights, and bolts.

Said he: "By the great broken circuit,
Or more, by the Ruhmkorff coil,
Your negative answers will drive me
To some subway under the soil.

"Not a spark of inductive affection,
Not a positive 'Yes' have I had;
I'm afraid the wires have grounded
In favor of some other lad."

Then regret, like a galvanometer,
Or an astatic needle, it smote her,
And she said: "Of love I have ions
As strong as an Edison motor."

So he opened the circuit and clasped her
In arm-ature, and held her there;
And she was the belle electric
Of this thermo-electric pair.

We are pleased to advise our readers that the firm of H. K. Mulford Company, Philadelphia and Chicago, are now in position to fill orders for a reliable and thoroughly standard article of diphtheria antitoxine serum.

Early in November, 1894, the firm of Mulford Company, in order to guarantee their patrons and the medical profession of America a thoroughly reliable diphtheria antitoxine serum, and at the earnest solicitation of many of the leading consultants established a biological department for the production of antitoxine and allied products, at 3907-11 Eggesfield street, Philadelphia. This laboratory is equipped without regard to expense. It is under the direction of Dr. Joseph McFarland, lecturer on bacteriology, University of Pennsylvania.

The horses are under the direct supervision of Dr. Leonard Pearson, professor of theory and practice of veterinary medicine, University of Pennsylvania.

The standardizing of their antitoxine is not only carried out in their own laboratory, but is also confirmed by department of hygiene, Uni-

versity of Pennsylvania, each package being dated and stamped with its strength expressed in immunity units.

Messrs. Mulford Company will be pleased to have the medical profession inspect their Biological Laboratory on the first Tuesday of each month, from 3 to 5.30 P. M., or at other times, by request, cards being issued from their office on application.

Not only is the enterprise of this firm to be commended, but the efforts they have made to place this article above a commercial product, in having their product tested by disinterested and reliable authorities, protects the profession and speaks well for the confidence which the firm has in their preparation.

Wayside Notes.

By E. B. Sangree, M. D., Philadelphia.

It is interesting to observe in the average city physician's office the care with which it is so arranged that there shall be as much openness as is possibly consistent with a decent sense of security on the part of the patient. If this plan had been followed by all in years gone by there would be less falls from grace recorded, and less blackmail than is now quietly being paid.

As no other class of men is subjected to so many temptations nor has so many opportunities of moral transgression as have physicians, these owe it to themselves and to their patients that every precaution be taken to protect them not only against others, but against themselves as well.

As an illustration to this preamble I heard some time ago a singular case of a physician's fall. He had, by the way, everything that a doctor considers essential to a happy and comfortable life. In the first place he had an inherited name which would be worth 10 years of an ordinary physician's life to start with in Philadelphia. He had ability, brilliancy and a very excellent and

rapidly growing practice. The addition of a lovely and companionable wife and two children complete the picture.

The wife, however, and no doubt for some good reason, began to suspect him of undue gallantry, and in order either to confirm or allay her suspicions adopted a course of proceeding that seems almost beyond credence for its uniqueness.

She disguised herself in some way with veils, I do not know exactly how, but at any rate so successfully that her husband did not recognize her, went as a patient to his office, proceeded to use her wiles on him and he quickly succumbed. Arrangements were made to meet and take her to a certain resort a few evenings later. Just as they were about to leave this place, after spending the evening together, she revealed herself and the ensuing tableaux can better be imagined than described. On account of the children, I suppose, she remained under the same roof with him, but the romance of their wedded life was ended forever.

Unfortunately, in order to assuage his misery, he took the worst means possible, namely, drink, and by so doing simply added another injury to the first. From this time his downward course was rapid. First he lost his positions, then gradually his practice, next his house and finally his life—died a drunkard.

Prescriptions.

ADMINISTRATION OF IODINE BY THE RECTUM.

When iodine compounds cannot be taken by the mouth they may be given by enema, and the following formula is taken from *Le Journal de Medecine de Paris*:

- R. Iodide of potassium.gr. xlv.
Bromide of potassium.gr. xxx.
Extract of belladonna.gr. v.
Water.oz. xij.

To be divided in 20 parts, each one of which shall be added to two to four ounces of hot water at the time of the injection.

BRONCHITIS.

As an expectorant in bronchitis, terpene hydrate can be given in perles or in this pill:

- R. Terpini Hydrat., gr. iij.
Sacch. Alb.
Gum. Acaciæ q. s. ut fiat pil. j.

Or else in a mixture:

- R. Terpini Hydrat., drachms j.
Lycerini q. s., ut fiat sol.
Syrup. Tolut. ad ounces ij.

M. Sig. One teaspoonful every three hours.

A favorite cough mixture for coughs and colds, particularly after influenza, contains in each dose:

- R. Ammon. Bromid. gr. v.
Tinct. Camph. Co. max.
Ext. Glycyrr. Liquid. mv.
Tinct. Digitalis miiij.
Syrup. Scillæ mxv.
Syrup dr. ss.
Aque ad dr. ij.

OBSTINATE RINGWORM.

Dr. C. W. Cutler recommends the application of this mixture:

- R. Acidi carbolici.
Tincture iodini.
Chloralis hydrati.aa.oz. j
M. —Med. T. and H. G.

TRANSPORTATION TO THE AMERICAN MEDICAL ASSOCIATION.

Physicians desiring to attend the meeting of the American Medical Association at Baltimore, Md., May 7 to 10, will find it to their advantage to purchase tickets over the Baltimore & Ohio route.

Those from the East will enjoy the famous Blue Line expresses from New York and Philadelphia, which provide every comfort and ease known in passenger service with no extra charge for fast time.

Those from the South and West can travel over the picturesque and gain the additional advantage of passing through Washington en route to Baltimore.

In purchasing tickets over this line physicians should obtain a certificate of the purchase from the ticket agent which, when signed by Dr. Atkinson, the permanent secretary of the Association at Baltimore, will enable the owner to obtain his return ticket at one-third rates.